NATURE OF ACTIVE GALACTIC NUCLEI FROM MASSIVE INSTANTANEOUS RADIO SPECTRA STUDY WITH RATAN–600 IN 1997–2006 SUPPLEMENTED BY VLBA EXPERIMENTS

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We present results of observations of 1–22 GHz instantaneous continuum spectra of about 3000 active galactic nuclei performed in 1997–2006 with the 600 meter ring transit radio telescope RATAN–600. An analysis of types and structure of the measured instantaneous spectra has lead us to a conclusion that almost all spectra could be modeled as a sum of two main spectral components: LF-component (decreasing with frequency) and HF-component (with a maximum in cm-mm band). In the framework of a model with longitudinal magnetic field, the HF-component is explained by synchrotron radiation of a continuous compact relativistic jet emerging from the nucleus, the LF-component — by radiation of optically thin extended peripheral structures which accumulate jet particles. Long term variability is studied in about 600 AGNs. It is dominated in the same model by the variable emission of a compact jet (HF-component) and is explained by variable flow of relativistic particles injected in the jet base. We also apply another model, a standard homogeneous blob of relativistic particles with synchrotron self-absorption, for sources with simple parsec scale structure and peaked spectral shape. On the basis of our combined RATAN and VLBA measurements, we estimate the magnetic field in jet regions of these sources and compare it with estimations provided by the model with longitudinal magnetic field.